- For use in transforming colors between color 1 imaging\systems, a color mapping method comprising: 2 using forward transformation profiles that 3 characterize the color imaging systems to generate 4 respective sets of device-independent color values for the 5 color imaging systems; 6 calculating color conversions by recursively 7 reducing differences between the sets of device-independent 8 9 color values; and
- 10 constructing a color map describing a relationship
 11 between the color imaging systems using the color .
 12 conversions.
 - 2. A color mapping method, according to claim 1,
 2 further comprising recursively reducing differences between
 3 black channel information.

 - 4. A color mapping method, according to claim 1, further comprising configuring at least one of the profiles

- 3 to account for certain perceptual effects on color
- 4 appearance.
- A color mapping method, according to claim 1,
- 2 wherein the color map comprises at least one of the
- 3 following: a lookup table, and an equation.
- 1 6. A color mapping method, according to claim 1,
- 2 further comprising:
- 3 storing the color map;
- 4 detecting respective types of color imaging
- 5 devices between which a color transformation is to be
- 6 performed; and
- 7 in response to the detected types, selecting a
- 8 stored color map.
- 1 \ 7. For use in transforming colors between source
- 2 and destination color imaging systems, a color mapping
- 3 method comprising:
- 4 using profiles that characterize the color imaging
- 5 systems to generate device-independent color values for the
- 6 source color imaging system, the device-independent color

Sys

- 7 values having a same dimensionality as the source color
- 8 imaging system;
- 9 using the profiles to perform a color conversion
- 10 for converting the device-independent color values to
- 11 device-dependent values of the destination color imaging
- 12 system; and
- using the color conversion to define a color map
- 14 for transforming colors between the color imaging systems.
 - 8. A color mapping method, according to claim 7,
- wherein the color conversion is performed at least twice.
- 9. A color mapping method, according to claim 7,
- 2 further comprising:
- 3 using the color conversion to evaluate its
- 4 accuracy at least once; and
- 5 revising the color conversion at least once to
- 6 improve its accuracy.
- 1 10. For use in transforming colors between source
- 2 and destination color imaging systems, a color mapping
- 3 method comprising:

- using profiles characterizing the color 1 imaging system's to generate device-independent color values 2 for the source color imaging system, the device-independent 3 4 color values having a same dimensionality as the source color imaging system; 5 6 using the profiles to perform a color conversion for converting the device-independent color 7 values to device-dependent values of the destination color 8 imaging system; 9 (c) using the color conversion to improve the 10 accuracy of the color conversion relative to a quality 11 threshold; 13 (d) returning to step (c) until the color conversion satisfies the quality threshold; and 14 (e) using the color conversion to define a color 15 map for transforming colors between the color imaging 16 17 systems. For use in transforming colors between color 1 11.

 - imaging systems, a color mapping arrangement comprising: 2
 - means for using forward transformation profiles 3
 - that characterize the color imaging systems to generate 4

coordinates;

12

respective sets of device-independent color values for the color imaging systems; 6 7 means for calculating color conversions by recursively reducing differences between the sets of device-8 independent color values; and 9 means\for constructing a color map describing a 10 relationship between the color imaging systems using the 11 color conversions 12 For use in transforming colors between first 1 and second color imaging systems respectively using first 2 and second color coordinate systems, a color mapping method comprising: generating first device-independent color coordinates as a function of color coordinates in the first color coordinate system; 7 estimating preliminary color coordinates in (b) 8 the second color coordinate system; 9 generating second device-independent color 10 coordinates as a function of the preliminary color 11

6

7

color imaging systems,

adjusting the preliminary color coordinates 13 to reduce an error between the first and second device-14 independent color coordinates; 15 returning to step (a) until the error 16 (e) satisfies a quality threshold; and 17 constructing a color map describing a 18 relationship between the first and second color imaging 19 systems as a function of the adjusted color coordinates. 20 A color mapping method, according to claim 1 12, further comprising using the color coordinates in the first color coordinate system to estimate the preliminary color coordinates. For use in transforming colors between color 1 14. imaging systems, a color mapping arrangement comprising: 2 a computer arrangement, programmed to 3 use forward transformation profiles that 4 characterize the color imaging systems to generate 5

respective sets of device-independent color values for the

#10

- 8 calculate color conversions by recursively
- 9 reducing differences between the sets of device-independent
- 10 color values, and
- 11 \ construct a color map describing a
- 12 relationship between the color imaging systems using the
- 13 color conversions; and
- a memory, configured and arranged to store the
- 15 color map.
- 1 15. A color mapping arrangement, according to
- 2 claim 14, wherein the computer arrangement is further
- programmed to use an error function for calculating the color conversions.
- 1 16. A color mapping arrangement, according to
- 2 claim 14, wherein the computer arrangement is further
- 3 programmed to configure at least one of the profiles to
- 4 account for certain perceptual effects on color appearance.
- 1 17. A color mapping arrangement, according to
- 2 claim 14, wherein the computer arrangement is further
- 3 programmed to construct at least one of the following: a
- 4 lookup table, and an equation.

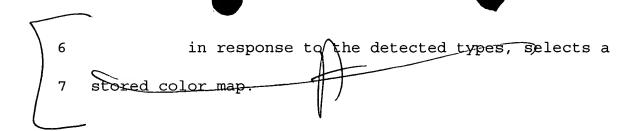
```
18. A color mapping arrangement, according to
 1
    claim 14, wherein the computer arrangement is further
 2
    programmed to
 3
              detect respective types of color imaging devices
 4
    between which a color transformation is to be performed, and
 5
              in response to the detected types, select a stored
 6
 7
    color map.
                   For\use in transforming colors between color
 1
    imaging systems, a data storage medium storing a computer-
 2
    executable program that, when executed,
              uses forward\transformation profiles that
    characterize the color imaging systems to generate
    respective sets of device-independent color values for the
 6
    color imaging systems;
 7
              calculates color conversions by recursively
 8
    reducing differences between the sets of device-independent
 9
    color values, and
10
11
              constructs a color map describing a relationship
    between the color imaging systems using the color
12
    conversions.
13
```

	19	,					18
1	2,0.	A data	storage medium,	according	to	claim	29,

- 2 wherein the computer-executable program recursively reduces
- 3 differences between black channel information.

18

- 1 21. A data storage medium, according to claim 19,
- 2 wherein the computer-executable program uses an error
- 3 function for calculating the color conversions.
- 1 22. A data storage medium, according to claim 19,
- 2 wherein the computer-executable program configures at least
- 3 one of the profiles to account for certain perceptual
- 4 effects on color appearance.
- 1 23. A data storage medium, according to claim 19,
- 2 wherein the computer-executable program generates at least
- 3 one of the following: a lookup table, and an equation.
- 1 24. A data storage medium, according to claim 19,
- 2 wherein the computer executable program:
- 3 stores the color pap;
- 4 detects respective types of color imaging devices
- 5 between which a color transformation is to be performed; and



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